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FACILITATING TRANSITION TIMES WITH HANDICAPPED PRESCHOOL CHILDREN: A COMPARISON BETWEEN PEER-MEDIATED AND ANTECEDENT PROMPT PROCEDURES

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We examined the effects of a peer-mediated versus an antecedent prompt condition on the rate of independent movement and appropriate behavior of handicapped preschool children during three classroom transition times. Using an alternating treatments design, results showed that each treatment condition yielded increases in target behaviors; however, the antecedent prompt condition was superior during all three transition settings. In addition, teacher prompts to these children were significantly reduced during the intervention conditions, indicating that the children were making these transitions more independently.

DESCRIPTORS: developmentally delayed children, preschool children, peer mediation, alternating treatments

One event occurring in the preschool environment rarely addressed by either social scientists or educational researchers is that of transition times. Daily transition times challenge even the most experienced teachers. These moves from one activity to another present opportunities for disturbance, if not chaos, when not carefully planned (Furman & Katan, 1969). The importance of facilitating smooth transitions is highlighted by the fact that preschool children spend as much as 20% to 35% of their class time in transition from one activity to another (Sainato & Lyon, 1983). This time allotment frequently exceeds the amount of time typically spent in active academic responding (Carta, 1986).

Significant among the few published intervention studies designed to alter transition times are those that manipulated antecedent events by introducing stimuli that set the occasion for performance. This tactic has been implemented by Wurtele and Drabman (1984) who required children to clean up before a buzzer sounded. Not only did the "beat the buzzer" game reduce the amount of time for clean-up, but this effect generalized to conditions when the teacher was absent. In another study manipulating antecedent events, Goetz, Ayala, Hatfield, Marshall, and Etzel (1983) taught 14 preschool children to quickly clean up by pairing an auditory stimulus (i.e., a clicking sound) with teacher praise. When the auditory stimulus was used alone, the chilren maintained the target behavior.

In a related line of research, Carden Smith and Fowler (1984) demonstrated that kindergarten children with serious behavior problems were able to implement successfully and respond to a peer-managed token program that targeted transition behavior. The use of peers as classroom monitors provides an interesting alternative to exclusive teacher direction. Classroom peers, in a management position, may be able to more consistently monitor and provide consequences for child behavior than a teacher who must attend to an entire class of students. Furthermore, data indicate that peer monitors display the same high levels of appropriate behavior as the students they are monitoring (S. A. Fowler, 1986).

Both antecedent event strategies and the peer-mediated strategy have been effective in altering

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children's behavior during transition times. However, no studies have examined the *relative* effectiveness of these two general strategies. Two specific interventions were implemented and compared in this study. The first, a peer-mediated procedure, involved assigning nonhandicapped peers as "buddies" for handicapped students during transition times. The second intervention involved antecedent prompting in the form of instructions to "go ring the bell." The bell signaled the completion of a transition by the target students.

METHOD

Children and Setting

This study was conducted in an integrated preschool classroom (15 m × 12 m) at a large urban elementary school. There were 5 handicapped and 6 nonhandicapped children enrolled in the classroom. The classroom was arranged similarly to a typical preschool classroom. The materials available included books, puzzles, blocks, a kitchen/dress-up area, and tables. Two classroom teachers were present throughout the entire study.

The target children were 3 males (ages 4 years, 4 years 1 month, and 3 years 7 months at the outset of the study). All 3 children failed to achieve a basal on the McCarthy Scales of Children's Abilities (McCarthy, 1972) and were rated as severely autistic on the Child Autism Rating Scale (Schopler, Reichler, DeVellis, & Daly, 1980) upon entry into the preschool program. All 3 children exhibited stereotypic behaviors such as perseverative speech, object preoccupation, and hand-waving. Two of these children (C_1 and C_2) displayed little functional communication and avoided or ignored contact with peers. The children were selected on the basis of direct observations during transition times, as well as teacher rankings of their relative inability to complete transitions.

All 6 normally developing peers in the class (3 males and 3 females) had opportunities to serve as intervention agents during the peer-mediated intervention. These children, ranging in age from 4 years 2 months to 5 years, were at or above age level on the McCarthy Scales of Children's Abilities (McCarthy, 1972) and the Learning Accomplishment Profile (LeMay, Griffin, & Sanford, 1977).

To obtain a measure of child performance during transition periods, a common metric, meters per second, was derived by measuring the distance of the transition and dividing it by the amount of time it took the child to complete the transition. Preliminary observations of the target subjects and their classmates during three transition times confirmed teacher ratings by yielding the lowest rates of behavior in the classroom. In addition, these preliminary observations also provided normative data on the transition behaviors of the other children. The mean rate of movement during transition time was 0.40 m per s (range, 0.30 to 0.58) and the mean percentage of appropriate behavior was 84.5% (range, 70% to 100%).

The transitions between activities were as follows:

1. Transition 1: Circle to Lesson. The children sat in a circle and as their names were called, they were directed to put their mats in their cubbies and to go to one of two specified lesson areas. The total distance was 12.8 m for Area A and 9.4 m for Area B.

2. Transition 2: Snack to Bathroom. The children were in the snack area. As the teacher called their names, they went to the table, got their garbage and placemats, put the garbage in the garbage can, put the placemats in a bin, and then lined up at the door to go to the bathroom. The total distance in this transition was 17.5 m.

3. Transition 3: Circle to Language. The children sat in a circle after bathroom. The teacher placed namecards on the floor in the middle of the circle. The teacher called their names and directed them to put their namecards in a specified pocket of a board and to go to the designated area for language. The distance from the circle to Areas A and C was 9.0 m and 0.5 m, respectively.

Behavioral Measures

Teacher behavior and the target children's performance was assessed by two trained observers using a 5-s continuous observational code. Five basic categories of teacher behavior were recorded: (a) *Verbal Prompts,* any verbal command or di-

rection given to the child by the teacher (e.g., "Brian, put your mat away and go to Tigger's table"); (b) *Partial Physical Prompt,* any physical contact by the teacher to the child (e.g., touching the child or turning him or her in the desired direction); (c) *Full Physical,* taking the child by the hand or arm and leading to the assigned area; (d) *Block,* standing in front of a child to prevent movement in an undesired direction; and (e) *Praise,* any positive verbal comment by the teacher to the child (e.g., "Nice following directions, Terry").

Child behavior categories were as follows: (a) *Appropriate Behavior,* the child responded to the teacher's command to move to a different area within 5 s. In addition, the child was to move straight to the new area without wandering, playing with any objects, or engaging in any stereotypic behavior or conversation. The child was recorded as completing the transition when he sat down in the newly assigned area; and (b) *Inappropriate Behavior,* engagement in any behavior which was off-task (e.g., engaging in wandering, playing with objects, stereotypic behavior, talking, attempting to leave the room), or not related to the given direction or command. A third observer used a stopwatch to record the length of time each child took to complete the transition.

As a measure of procedural implementation of the buddy system, data were taken on peer verbal and physical prompts, following the definitions described earlier for parallel categories of teacher behavior.

Observer Training and Reliability

Interobserver agreement among the three data collectors was calculated on a point-by-point basis. Agreement was calculated by dividing the sum of target behaviors recorded in agreement by that number plus the number recorded in disagreement, then multiplying by 100. Occurrence and nonoccurrence agreement was computed separately. Observers were required to achieve reliability coefficients exceeding 90% for 5 consecutive days with each other and the first author prior to data collection.

Subsequent reliability checks were randomly conducted and distributed evenly over 28% of the observation sessions. Agreement coefficients ranged from 92% to 100% and 90% to 94%, respectively, for the occurrence of all targeted teacher and child behaviors. Agreement coefficients for the nonoccurrence of teacher and child behaviors ranged from 85% to 95% and 86% to 97% for the two observers.

In addition to the interobserver agreement, reliability checks were also conducted on the timing of the children's movement from one area to the next. In a random check of 35% of the sessions, the accuracy was 96%.

Procedure and Design

An alternating treatments design was implemented to compare the effects of the peer-mediated versus the antecedent prompt condition on transition behavior for the 3 target children (C_1, C_2, and C_3) across the three settings.

Baseline 1. Teachers were asked to conduct the transition in the usual manner and to provide any necessary assistance. Stimulus cards representing the three separate conditions in effect during the treatment phases were present in Baseline 1 but the teachers provided no explanation of their use to the children. The cards were:

1. Card 1: Nontreatment Setting. This card had a large stoplight drawn on it showing a green light signal.

2. Card 2: Bell (i.e., antecedent prompt condition). The card representing the bell condition had a large hotel-desk type bell drawn on blue paper.

3. Card 3: Buddy (i.e., peer-mediated condition). The buddy condition was represented by a large "smile face" drawn on yellow paper.

It has been suggested by McGonigle, Rojahn, Dixon, and Strain (1987) that the presence of the stimulus during baseline ensures that subsequent behavior change cannot be attributed to the introduction of a novel stimulus.

Baseline 2. In this second baseline phase, teachers were asked to refrain from giving prompts, taking children to the new areas, and in general helping them through the transitions. Children had to make the transitions on their own. A cut-off point was implemented for children who were wan-

dering around after 4 min. This phase was implemented to obtain a measure of child behavior without teacher guidance.

Alternating treatments. The interventions were counterbalanced across two treatment settings (i.e., Transition 1 and Transition 2) and the two classroom teachers. The third transition was used as a baseline setting until the final phase of the study. Each intervention occurred daily. The interventions were as follows:

1. Peer-Mediated (i.e., the buddy system). All children in the group were shown Card 3. The teacher explained that certain children (the normally developing peers) would help their friends get to the next lesson. The teacher then modeled the system by taking a peer's hand and moving through the transition using whatever prompts were necessary. The teacher then assigned the pairs of buddies to go to the next lesson.

2. Antecedent Prompt (i.e., the bell). All children were shown Card 2. In this transition, each target child was given a specific direction to go to another area and "ring the bell." The peers were instructed to "let their friends go by themselves." The teachers intervened only if the target child became involved with some toy or other material in the room for more than 3 s.

3. No Treatment. For this transition, all children were shown Card 1. The teacher then individually instructed each child to go to a designated area. The peers were once again instructed to "let their friends go by themselves."

To facilitate the uniform implementation of the two treatments, scripts were provided for each intervention agent on the back of each poster. No additional training was given to either the teachers or the peers. Teachers were instructed not to prompt either target children or peers after the initial command was delivered.

4. Bell Only. Following the typical use of the alternating treatments design, the final phase of the study involved using the most effective procedure (Bell) across all transition periods.

RESULTS

In Figure 1 the data on meters per second are graphed across all study phases. In Baseline 1 and Baseline 2 the closed circle represents data taken in Transition Setting 1, the squares represent Transition Setting 2, and the triangles represent Transition Setting 3. During the alternating treatments condition, a continuing baseline is represented by the triangle in Setting 3. The antecedent prompt (Bell) intervention is represented by a square and the peer-mediated (Buddy) intervention is represented by a closed circle. In the final treatment condition (Bell intervention) closed circles represent Setting 1, squares represent Setting 2, and triangles represent Setting 3.

During the initial baseline, the rate of movement for C_1 was slightly higher than in Baseline 2. Subjects C_2 and C_3 showed very low and similar rates of movement across both baselines. On the first day of intervention under alternating treatments, the Bell condition produced a marked increase in all 3 children's rate of movement, doubling their prior rate. The antecedent intervention also improved child performance throughout this phase. Although the Buddy condition exerted a positive impact on child behavior, its effects were consistently surpassed by the Bell intervention. As seen in Figure 1, no change in child behavior was evident in the ongoing baseline condition that occurred in Setting 3 only. In the final treatment condition, the Bell intervention was implemented across all three settings. The rate of movement for all 3 children increased significantly in the third setting (closed triangles) which had previously been the No Treatment condition. The number of observed intervals of appropriate child behavior increased substantially from a mean level of 10.2% and 3.4% for all 3 children during Baselines 1 and 2 to a mean level of 88.6% during the Buddy treatment and 90.3% during the Bell intervention across all three settings.

Corresponding decreases in the level of teacher intervention were observed in conjunction with the increase in children's rate of movement during transitions. Because the vast majority of teacher behaviors were Verbal or Partial Physical prompts, all teacher interventions were combined for reporting purposes. The total number of teacher interventions was significantly reduced for C_1, C_2, and C_3 from a mean of 10.3, 9.6, and 10.2 in Baseline

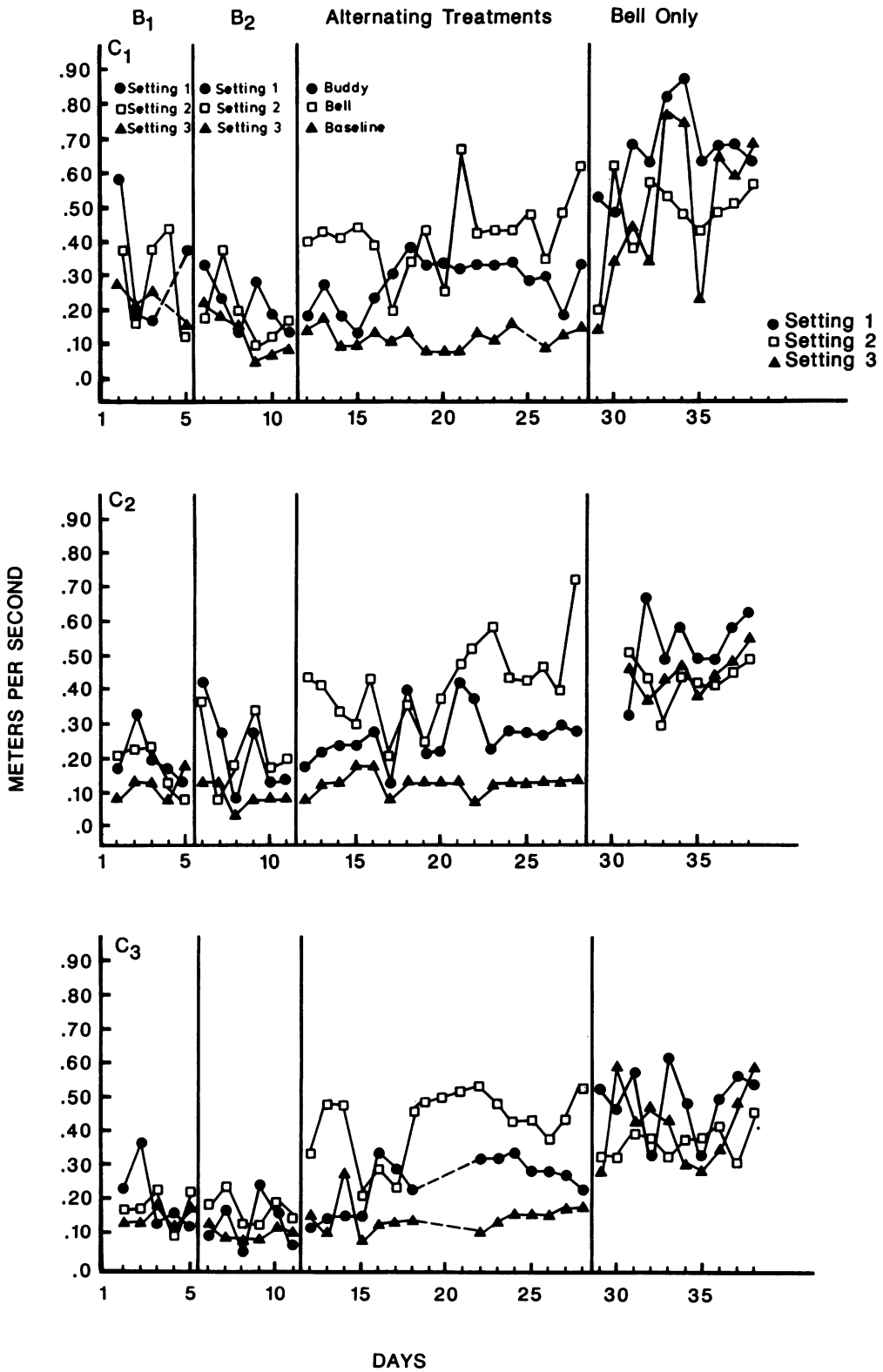

Figure 1. Rate of movement observed for target children C_1, C_2, and C_3 for each child in each treatment condition across three transition settings.

Table 1
Mean Number of Teacher Interventions Across All Settings and Conditions

	Baseline 1			Baseline 2			Alternating treatments			Bell only		
	Setting			Setting			Bell	Buddy	Baseline	Setting		
Subjects	1	2	3	1	2	3	1	2	3	1	2	3
C_1	11.4	9.6	10.0	3.8	9.0	6.0	3.4	1.7	3.4	2.6	1.8	2.5
C_2	11.8	10.8	6.2	3.0	7.0	3.8	3.1	2.1	3.3	1.7	1.7	2.0
C_3	6.4	9.4	10.0	4.8	5.2	4.2	2.4	1.3	2.5	2.2	2.3	2.2

2 to 2.5, 3.6, and 2.6, respectively, during the final Bell treatment condition. Table 1 summarizes the total number of teacher interventions across all settings and conditions.

As an additional measure of treatment implementation during the alternating treatments phase, peer prompts were recorded during the Buddy, Bell, and Baseline time periods. Across all days during the alternating treatments phase the total number of peer prompts ranged from 2 to 21 (M = 8.5) for the Buddy condition, from 1 to 2 (M = 0.05) in the Bell condition, and from 1 to 2 (M = 0.28) in the Baseline condition.

DISCUSSION

Results of this investigation indicate that handicapped preschool children with significant developmental delays and behavior problems can be taught to make transitions quickly and independently from one activity to another with minimal teacher attention. Although both interventions, the Buddy and the Bell, were effective in helping children increase their rates of movement during transition times in the classroom, the Bell transition was superior in the two treatment settings for all children.

The question of how the Bell condition reduced transition time is interesting. First, the bell, located at the endpoint of the transition, may have acted as a salient cue for the children to help them focus on the terminal goal. Second, because all of the children in the class (including the targets) appeared to enjoy ringing the bell, the bell may have taken on reinforcing properties. By way of contrast, it is not unreasonable to argue that the buddy system provided no specific reinforcing consequences for making transitions, but rather relied exclusively on repeated prompts from peers. Another possible explanation is that the teachers, in giving children the instruction to "go to the table and ring the bell," may have given children the alternative to perform a more desired behavior and in this way took the focus off a less desired behavior, namely, walking quickly and quietly to the next activity.

Although the Bell intervention was superior in producing increased rates of movement with less teacher prompting and more appropriate child behavior, it must be noted that the peer-mediated procedure also promoted an increase in desired behaviors. The buddy system also freed teachers from managing the transition by turning the responsibility over to the peers.

The results of this study extend in several ways the findings of previous studies which showed that the behavior of preschool children can be altered through environmental manipulations involving either the teacher's or the peer's role. First, with regard to the peer-mediated intervention, very few studies have used either very young or handicapped children as intervention agents (Odom & Strain, 1986). Also, unlike most peer-mediated interventions (Strain, 1981), no pretraining was needed in our study for the peer confederates. This is important in light of the fact that if extensive training or supervision is required by the teacher, the cost of such programs may prohibit their use (Carden Smith & Fowler, 1984).

Second, the antecedent prompt procedure is an interesting variation of the work by Wolfe, Kelly,

and Drabman (1981) and Carbone, Miller, and Todd (1981). In these investigations chilren were required to "beat" a buzzer or timer when performing various tasks at home or school. However, in these studies a reinforcer was made contingent on completing the task. Our study used no reinforcers per se for children completing the transition and therefore replicates findings by Wurtele and Drabman (1984) that the antecedent prompt may be enough to begin a stream of behaviors that are eventually reinforced by the completion of the task. Yet, as we noted earlier, the ringing of the bell may have operated as a reinforcing event for the children. If so, it may be more accurate to describe the bell intervention as both an antecedent *and* a consequent intervention package.

Another interesting aspect of this study is that it was easily implemented within the existing structure of the preschool. Neither the teachers nor the peers were removed from the classroom for systematic training. We identified and compared two interventions that could help the teacher with a task that had been her sole responsibility. As such, the decrease in the teacher's responsibility was accompanied by a corresponding demand on the target children to function independently. This ability to cope with the environment independently has been identified as one of the most important goals of early childhood education (W. Fowler, 1980).

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